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R. T.

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/429,530 10/28/99 FUKUMOTO

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005514 IM22/1002
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30 ROCKEFELLER PLAZA
NEW YORK NY 10112

EXAMINER

PEREZ RAMOS, V

ART UNIT	PAPER NUMBER
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1765

13

DATE MAILED:

10/02/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/429,530

Applicant(s)

FUKUMOTO, YOSHIHIKO

Examiner

Vanessa Perez-Ramos

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1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cady (U.S. 4,544,446) in view of Applicant's Admission of the Prior Art.

In regard to claims 11-12, 15, 17-24, 28- 29, 31-34, 37 and 39-44, Cady discloses a method for fabricating a semiconductor device (col. 1, lines 49-50) wherein a metal surface is polished (col. 2, lines 2-3); and the polished surface is cleaned by one of a variety of methods, including brush scrubbing (col. 1, line 53) and ultrasonic washing (col. 1, lines 53-54).

Cady does not disclose that the metal polished is formed in a wiring or contact pattern, which is in turn part of an insulating film formed on a substrate. Furthermore, Cady does not disclose the utilization of a combination of the above-described cleaning methods.

Applicant discloses as part of his Description of the Prior Art that a typical semiconductor manufacturing process comprises: forming , on a substrate, an insulating film with wiring contact thereon (p.2, lines 14-26), followed by CMP of the metal to polish and flatten the wiring material (p. 4, lines 1-18).

It would have been obvious to one skilled in the art at the time of the invention to modify Cady by polishing a metal that was formed in a wiring or contact pattern, which is in turn part of an insulating film formed on a substrate, because this is all part of a widely used and well known process for semiconductor manufacturing, as evidenced by Cady. Furthermore, even though

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Cady does not disclose a cleaning step that involves a combination of both jet scrubbing and ultrasonic scrubbing, it is the Examiner's position that this would have been obvious to one skilled in the art at the time of the invention, with the anticipation of achieving a clean surface. Since both cleaning methods claimed by Applicant have been utilized in the past for the same purpose (removing contaminants after polishing), it is just obvious that a combination of two or more of these well known methods would at least achieve the same cleaning degree of one method alone, and most possibly, would provide a cleaner surface than that obtained by one cleaning step/method alone.

In regard to claims 13-14, 16, 35-36 and 38, the variation of process parameters such as the frequency and rpm would have been obvious to one skilled in the art with the purpose of determining the best process conditions.

In regard to claims 25-26, all of the metals and alloys described by Applicant are well known and widely used in the art of semiconductor manufacturing, and their use would have been obvious to one skilled in the art.

In regard to claim 27, the use of barrier metal layers is well known in the art of semiconductor manufacturing, and its use would have been obvious to one skilled in the art.

In regard to claim 30, the use of polishing slurries containing abrasives is well known in the art of semiconductor manufacturing, and its use would have been obvious to one skilled in the art.

3. This is a continuation of applicant's earlier Application No. 09/429530. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first

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action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Perez-Ramos whose telephone number is 703-306-5510. The examiner can normally be reached on Mon-Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703-308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7718 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5665.

Vanessa Perez-Ramos
Examiner
Art Unit 1765

VPR
October 1, 2001


ROBERT KUNEMUND
PRIMARY EXAMINER